MF2142 Applying Distributed Control for Mechatronics System 6.0 credits

Tillämpning av distribuerad kontroll för mekatroniska system

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

The official course syllabus is valid from the autumn semester 2025, according to the decision by the Faculty Board: M-2024-0018. Date of decision: 2024-10-14.

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

University studies equivalent to at least 180 higher education credits in engineering or natural sciences, and the upper secondary school courses English B or English 6.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, the student should be able to:

1. Identify constraints that applications of mechatronic systems, and open frameworks for these, impose on idealised models of distributed control.

2. Evaluate the application of distributed control from a human-centered perspective.

3. Develop strategies to ensure system-wide characteristics, such as personal safety, through distributed control of mechatronic systems.

Course contents

The course introduces:

Basic aspects of distributed control, such as real-time systems and time-critical communication.

Design and implementation of distributed control of mechatronic systems such as robots, drones, autonomous vehicles, etc., specifically with respect to their intrinsic (real-time) characteristics and the use of open frameworks dedicated to this.

Critical evaluation of distributed systems and their functionality, specifically from fault tolerance and reliability engineering principles.

The course is made up of:

Lessons about basic aspects, design and implementation, and critical evaluation of distributed control.

A project assignment where students work in teams to design and implement mechatronic systems, as well as their distributed control, to solve tasks within e.g. time- or safety-critical constraints.

An individual report in which students reflect on the effect of uncritical use of idealised models of distributed control.

Examination

- PRO1 - Project work, 5.0 credits, grading scale: P, F
- INL1 - Hand in assignment, 1.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.